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ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Erwin Kawata
City & County of Honolulu
630 South Beretania Street
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Honolulu, Hawaii 96843

Generated 8/29/2023 4:42:40 PM

JOB DESCRIPTION

RED-HILL

JOB NUMBER

380-56354-1

Eurofins Eaton Analytical Pomona

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Eaton Analytical, LLC Project Manager.

Compliance Statement

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW, Water matrices)

Authorization



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Authorized for release by
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Definitions/Glossary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Qualifiers

LCMS

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Job ID: 380-56354-1

Laboratory: Eurofins Eaton Analytical Pomona

Narrative

Job Narrative 380-56354-1

Comments

No additional comments.

Receipt

The samples were received on 7/26/2023 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.3° C, 2.5° C and 2.9° C.

LCMS

Method 533: Analyte Perfluorobutanoic acid (PFBA) detected greater than 1/3 MRL in field reagent blank FB: AIEA WELLS PUMPS 1&2 (260) (380-56354-4). Associated native sample is ND for Perfluorobutanoic acid (PFBA). No impact to the sample results as sample is ND at 2ppt MRL for PFBA .

Method 537.1: Surrogate 13C2 PFHxA recovery for the following field reagent blank was outside the upper control limit: FB: AIEA GULCH WELLS PUMP 2 (380-56354-3). Extract was re-analyzed for confirmation and had similar high recovery. Associated native sample is ND for all target analytes. No impact to the sample ND results.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



Detection Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-1

No Detections.

Client Sample ID: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-2

No Detections.

Client Sample ID: FB: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-3

No Detections.

Client Sample ID: FB: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-4

No Detections.

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This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-1

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	79		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C6 PFDA	94		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C5 PFHxA	88		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C4 PFHpA	89		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C8 PFOA	87		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C9 PFNA	90		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C7 PFUnA	93		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C2 PFDoA	95		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C4 PFBA	90		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C5 PFPeA	89		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C3 PFBS	93		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C3 PFHxS	90		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C8 PFOS	90		50 - 200	08/07/23 04:32	08/10/23 02:21	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-1

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2-4:2-FTS	88		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C2-6:2-FTS	90		50 - 200	08/07/23 04:32	08/10/23 02:21	1
13C2-8:2-FTS	97		50 - 200	08/07/23 04:32	08/10/23 02:21	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:13	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	104		70 - 130			08/02/23 06:55	08/05/23 19:13	1
13C2 PFHxA	120		70 - 130			08/02/23 06:55	08/05/23 19:13	1
13C2 PFDA	110		70 - 130			08/02/23 06:55	08/05/23 19:13	1
13C3-GenX	106		70 - 130			08/02/23 06:55	08/05/23 19:13	1

Client Sample ID: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-2

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-2

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	77		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C6 PFDA	90		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C5 PFHxA	89		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C4 PFHpA	89		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C8 PFOA	90		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C9 PFNA	90		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C7 PFUnA	87		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C2 PFDoA	93		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C4 PFBA	91		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C5 PFPeA	90		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C3 PFBS	89		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C3 PFHxS	91		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C8 PFOS	93		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C2-4:2-FTS	97		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C2-6:2-FTS	93		50 - 200	08/07/23 04:32	08/10/23 02:31	1
13C2-8:2-FTS	92		50 - 200	08/07/23 04:32	08/10/23 02:31	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-2

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:33	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	116		70 - 130			08/02/23 06:55	08/05/23 19:33	1
13C2 PFHxA	122		70 - 130			08/02/23 06:55	08/05/23 19:33	1
13C2 PFDA	123		70 - 130			08/02/23 06:55	08/05/23 19:33	1
13C3-GenX	113		70 - 130			08/02/23 06:55	08/05/23 19:33	1

Client Sample ID: FB: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-3

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: FB: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-3

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	77		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C6 PFDA	87		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C5 PFHxA	83		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C4 PFHpA	88		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C8 PFOA	90		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C9 PFNA	88		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C7 PFUnA	85		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C2 PFDoA	88		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C4 PFBA	92		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C5 PFPeA	91		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C3 PFBS	87		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C3 PFHxS	84		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C8 PFOS	87		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C2-4:2-FTS	90		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C2-6:2-FTS	89		50 - 200	08/07/23 04:32	08/10/23 02:40	1
13C2-8:2-FTS	94		50 - 200	08/07/23 04:32	08/10/23 02:40	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: FB: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-3

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
11-Chloroeicosafuoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/02/23 06:55	08/10/23 07:53	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	105		70 - 130			08/02/23 06:55	08/10/23 07:53	1
13C2 PFHxA	136	S1+	70 - 130			08/02/23 06:55	08/10/23 07:53	1
13C2 PFDA	122		70 - 130			08/02/23 06:55	08/10/23 07:53	1
13C3-GenX	127		70 - 130			08/02/23 06:55	08/10/23 07:53	1

Client Sample ID: FB: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-4

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafuoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: FB: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-4

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/07/23 04:32	08/10/23 02:50	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	81		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C6 PFDA	85		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C5 PFHxA	88		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C4 PFHpA	86		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C8 PFOA	89		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C9 PFNA	90		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C7 PFUnA	82		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C2 PFDoA	87		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C4 PFBA	88		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C5 PFPeA	83		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C3 PFBS	93		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C3 PFHxS	85		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C8 PFOS	88		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C2-4:2-FTS	94		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C2-6:2-FTS	86		50 - 200			08/07/23 04:32	08/10/23 02:50	1
13C2-8:2-FTS	88		50 - 200			08/07/23 04:32	08/10/23 02:50	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
N-methylperfluorooctanesulfonamide acetic acid (NMeFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
N-ethylperfluorooctanesulfonamide acetic acid (NEtFOSAA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: FB: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-4

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/02/23 06:55	08/05/23 19:54	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	116		70 - 130			08/02/23 06:55	08/05/23 19:54	1
13C2 PFHxA	117		70 - 130			08/02/23 06:55	08/05/23 19:54	1
13C2 PFDA	113		70 - 130			08/02/23 06:55	08/05/23 19:54	1
13C3-GenX	111		70 - 130			08/02/23 06:55	08/05/23 19:54	1

Surrogate Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		d5NEFOS (70-130)	PFHxA (70-130)	PFDA (70-130)	GenX (70-130)
380-56347-B-2-A MS	Matrix Spike	110	120	123	102
380-56347-C-2-A MSD	Matrix Spike Duplicate	122	128	126	117
380-56354-1	AIEA GULCH WELLS PUMP 2	104	120	110	106
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	116	122	123	113
380-56354-3	FB: AIEA GULCH WELLS PUMF 2	105	136 S1+	122	127
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	116	117	113	111
LCS 380-49932/25-A	Lab Control Sample	108	124	116	116
LCSD 380-49932/26-A	Lab Control Sample Dup	113	114	114	107
MBL 380-49932/23-A	Method Blank	118	129	128	113
MRL 380-49932/24-A	Lab Control Sample	113	106	104	92

Surrogate Legend

d5NEFOS = d5-NEtFOSAA
 PFHxA = 13C2 PFHxA
 PFDA = 13C2 PFDA
 GenX = 13C3-GenX



Isotope Dilution Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HFPODA (50-200)	C6PFDA (50-200)	13C5PHA (50-200)	C4PFHA (50-200)	C8PFOA (50-200)	C9PFNA (50-200)	13C7PUA (50-200)	PFDaA (50-200)
380-56249-B-1-A LMS	Matrix Spike	92	101	98	97	88	95	98	106
380-56249-C-1-A LMSD	Matrix Spike Duplicate	91	96	96	91	89	95	96	102
380-56354-1	AIEA GULCH WELLS PUMP 2	79	94	88	89	87	90	93	95
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	77	90	89	89	90	90	87	93
380-56354-3	FB: AIEA GULCH WELLS PUMF 2	77	87	83	88	90	88	85	88
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	81	85	88	86	89	90	82	87
LCS 380-50566/23-A	Lab Control Sample	82	80	87	86	86	83	79	83
LCSD 380-50566/24-A	Lab Control Sample Dup	89	91	89	91	90	92	88	94
MBL 380-50566/21-A	Method Blank	83	90	85	88	92	94	87	90
MRL 380-50566/22-A	Lab Control Sample	82	88	89	93	91	91	82	90

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (50-200)	PFPeA (50-200)	C3PFBS (50-200)	C3PFHS (50-200)	C8PFOS (50-200)	42FTS (50-200)	62FTS (50-200)	82FTS (50-200)
380-56249-B-1-A LMS	Matrix Spike	90	90	93	87	90	90	84	91
380-56249-C-1-A LMSD	Matrix Spike Duplicate	93	93	87	87	89	87	85	90
380-56354-1	AIEA GULCH WELLS PUMP 2	90	89	93	90	90	88	90	97
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	91	90	89	91	93	97	93	92
380-56354-3	FB: AIEA GULCH WELLS PUMF 2	92	91	87	84	87	90	89	94
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	88	83	93	85	88	94	86	88
LCS 380-50566/23-A	Lab Control Sample	90	87	93	88	86	82	89	85
LCSD 380-50566/24-A	Lab Control Sample Dup	94	93	92	96	92	86	93	92
MBL 380-50566/21-A	Method Blank	94	97	100	92	94	103	101	107
MRL 380-50566/22-A	Lab Control Sample	95	91	99	94	92	98	100	97

Surrogate Legend

HFPODA = 13C3 HFPO-DA
 C6PFDA = 13C6 PFDA
 13C5PHA = 13C5 PFHxA
 C4PFHA = 13C4 PFHpA
 C8PFOA = 13C8 PFOA
 C9PFNA = 13C9 PFNA
 13C7PUA = 13C7 PFUnA
 PFDaA = 13C2 PFDaA
 PFBA = 13C4 PFBA
 PFPeA = 13C5 PFPeA
 C3PFBS = 13C3 PFBS
 C3PFHS = 13C3 PFHxS
 C8PFOS = 13C8 PFOS
 42FTS = 13C2-4:2-FTS
 62FTS = 13C2-6:2-FTS
 82FTS = 13C2-8:2-FTS

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Lab Sample ID: MBL 380-50566/21-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 50566

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosfluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<0.30		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<0.30		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<1.0		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorobutanesulfonic acid (PFBS)	<0.37		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorododecanoic acid (PFDoA)	<0.54		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoroheptanoic acid (PFHpA)	<0.39		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorohexanesulfonic acid (PFHxS)	<0.32		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorohexanoic acid (PFHxA)	<0.46		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorononanoic acid (PFNA)	<0.40		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorooctanesulfonic acid (PFOS)	<0.43		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorooctanoic acid (PFOA)	<0.38		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoroundecanoic acid (PFUnA)	<0.42		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluorobutanoic acid (PFBA)	<0.69		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.38		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.37		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.48		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.47		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<0.25		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.46		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.15		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoropentanoic acid (PFPeA)	<0.38		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.36		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1
Perfluoropentanesulfonic acid (PFPeS)	<0.39		2.0	ng/L		08/07/23 04:32	08/10/23 00:44	1

Isotope Dilution	MBL %Recovery	MBL Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	83		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C6 PFDA	90		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C5 PFHxA	85		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C4 PFHpA	88		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C8 PFOA	92		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C9 PFNA	94		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C7 PFUnA	87		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C2 PFDoA	90		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C4 PFBA	94		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C5 PFPeA	97		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C3 PFBS	100		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C3 PFHxS	92		50 - 200	08/07/23 04:32	08/10/23 00:44	1

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MBL 380-50566/21-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 50566

<i>Isotope Dilution</i>	<i>MBL %Recovery</i>	<i>MBL Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C8 PFOS	94		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C2-4:2-FTS	103		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C2-6:2-FTS	101		50 - 200	08/07/23 04:32	08/10/23 00:44	1
13C2-8:2-FTS	107		50 - 200	08/07/23 04:32	08/10/23 00:44	1

Lab Sample ID: LCS 380-50566/23-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50566

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec Limits</i>
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	60.1	59.0		ng/L		98	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	60.1	58.6		ng/L		97	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	60.1	63.3		ng/L		105	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	60.1	65.2		ng/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	60.1	62.1		ng/L		103	70 - 130
Perfluorodecanoic acid (PFDA)	60.1	66.2		ng/L		110	70 - 130
Perfluorododecanoic acid (PFDoA)	60.1	61.3		ng/L		102	70 - 130
Perfluoroheptanoic acid (PFHpA)	60.1	64.0		ng/L		106	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	60.1	64.5		ng/L		107	70 - 130
Perfluorohexanoic acid (PFHxA)	60.1	61.2		ng/L		102	70 - 130
Perfluorononanoic acid (PFNA)	60.1	65.1		ng/L		108	70 - 130
Perfluorooctanesulfonic acid (PFOS)	60.1	63.3		ng/L		105	70 - 130
Perfluorooctanoic acid (PFOA)	60.1	64.3		ng/L		107	70 - 130
Perfluoroundecanoic acid (PFUnA)	60.1	64.0		ng/L		106	70 - 130
Perfluorobutanoic acid (PFBA)	60.1	60.6		ng/L		101	70 - 130
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	60.1	64.8		ng/L		108	70 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	60.1	67.5		ng/L		112	70 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	60.1	61.1		ng/L		102	70 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	60.1	57.4		ng/L		95	70 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	60.1	59.2		ng/L		98	70 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	60.1	57.9		ng/L		96	70 - 130
Perfluoro-4-methoxybutanoic acid (PFMBA)	60.1	63.4		ng/L		105	70 - 130
Perfluoropentanoic acid (PFPeA)	60.1	64.0		ng/L		106	70 - 130
Perfluoroheptanesulfonic acid (PFHpS)	60.1	68.0		ng/L		113	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCS 380-50566/23-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoropentanesulfonic acid (PFPeS)	60.1	65.0		ng/L		108	70 - 130
LCS LCS							
Isotope Dilution	%Recovery	Qualifier	Limits				
13C3 HFPO-DA	82		50 - 200				
13C6 PFDA	80		50 - 200				
13C5 PFHxA	87		50 - 200				
13C4 PFHpA	86		50 - 200				
13C8 PFOA	86		50 - 200				
13C9 PFNA	83		50 - 200				
13C7 PFUnA	79		50 - 200				
13C2 PFDoA	83		50 - 200				
13C4 PFBA	90		50 - 200				
13C5 PFPeA	87		50 - 200				
13C3 PFBS	93		50 - 200				
13C3 PFHxS	88		50 - 200				
13C8 PFOS	86		50 - 200				
13C2-4:2-FTS	82		50 - 200				
13C2-6:2-FTS	89		50 - 200				
13C2-8:2-FTS	85		50 - 200				

Lab Sample ID: LCSD 380-50566/24-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	60.1	60.0		ng/L		100	70 - 130	2	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	60.1	60.6		ng/L		101	70 - 130	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	60.1	65.4		ng/L		109	70 - 130	3	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	60.1	68.6		ng/L		114	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)	60.1	62.5		ng/L		104	70 - 130	1	30
Perfluorodecanoic acid (PFDA)	60.1	63.2		ng/L		105	70 - 130	5	30
Perfluorododecanoic acid (PFDoA)	60.1	64.5		ng/L		107	70 - 130	5	30
Perfluoroheptanoic acid (PFHpA)	60.1	65.1		ng/L		108	70 - 130	2	30
Perfluorohexanesulfonic acid (PFHxS)	60.1	61.8		ng/L		103	70 - 130	4	30
Perfluorohexanoic acid (PFHxA)	60.1	63.6		ng/L		106	70 - 130	4	30
Perfluorononanoic acid (PFNA)	60.1	68.1		ng/L		113	70 - 130	5	30
Perfluorooctanesulfonic acid (PFOS)	60.1	63.6		ng/L		106	70 - 130	1	30
Perfluorooctanoic acid (PFOA)	60.1	65.7		ng/L		109	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)	60.1	62.6		ng/L		104	70 - 130	2	30
Perfluorobutanoic acid (PFBA)	60.1	61.5		ng/L		102	70 - 130	1	30

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCSD 380-50566/24-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	60.1	62.4		ng/L		104	70 - 130	4	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	60.1	65.7		ng/L		109	70 - 130	3	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	60.1	60.1		ng/L		100	70 - 130	2	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	60.1	62.5		ng/L		104	70 - 130	9	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	60.1	60.5		ng/L		101	70 - 130	2	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	60.1	57.6		ng/L		96	70 - 130	0	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	60.1	61.1		ng/L		102	70 - 130	4	30
Perfluoropentanoic acid (PFPeA)	60.1	61.0		ng/L		101	70 - 130	5	30
Perfluoroheptanesulfonic acid (PFHpS)	60.1	64.9		ng/L		108	70 - 130	5	30
Perfluoropentanesulfonic acid (PFPeS)	60.1	61.8		ng/L		103	70 - 130	5	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	LCSD Limits
13C3 HFPO-DA	89		50 - 200
13C6 PFDA	91		50 - 200
13C5 PFHxA	89		50 - 200
13C4 PFHpA	91		50 - 200
13C8 PFOA	90		50 - 200
13C9 PFNA	92		50 - 200
13C7 PFUnA	88		50 - 200
13C2 PFDoA	94		50 - 200
13C4 PFBA	94		50 - 200
13C5 PFPeA	93		50 - 200
13C3 PFBS	92		50 - 200
13C3 PFHxS	96		50 - 200
13C8 PFOS	92		50 - 200
13C2-4:2-FTS	86		50 - 200
13C2-6:2-FTS	93		50 - 200
13C2-8:2-FTS	92		50 - 200

Lab Sample ID: MRL 380-50566/22-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.00	1.91	J	ng/L		95	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	2.00	2.05	J	ng/L		102	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	2.00	2.27	J	ng/L		113	50 - 150

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MRL 380-50566/22-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	2.00	2.32	J	ng/L		116	50 - 150
Perfluorobutanesulfonic acid (PFBS)	2.00	2.12	J	ng/L		106	50 - 150
Perfluorodecanoic acid (PFDA)	2.00	2.18	J	ng/L		109	50 - 150
Perfluorododecanoic acid (PFDoA)	2.00	2.23	J	ng/L		111	50 - 150
Perfluoroheptanoic acid (PFHpA)	2.00	2.36	J	ng/L		118	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	2.00	2.38	J	ng/L		119	50 - 150
Perfluorohexanoic acid (PFHxA)	2.00	2.32	J	ng/L		116	50 - 150
Perfluorononanoic acid (PFNA)	2.00	2.33	J	ng/L		116	50 - 150
Perfluorooctanesulfonic acid (PFOS)	2.00	2.22	J	ng/L		111	50 - 150
Perfluorooctanoic acid (PFOA)	2.00	2.37	J	ng/L		118	50 - 150
Perfluoroundecanoic acid (PFUnA)	2.00	2.26	J	ng/L		113	50 - 150
Perfluorobutanoic acid (PFBA)	2.00	2.35	J	ng/L		117	50 - 150
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	2.00	2.21	J	ng/L		110	50 - 150
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	2.00	2.56	J	ng/L		128	50 - 150
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.00	2.17	J	ng/L		108	50 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.00	2.02	J	ng/L		101	50 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	2.00	2.12	J	ng/L		106	50 - 150
Perfluoro-3-methoxypropanoic acid (PFMPA)	2.00	1.90	J	ng/L		95	50 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	2.00	2.29	J	ng/L		114	50 - 150
Perfluoropentanoic acid (PFPeA)	2.00	2.36	J	ng/L		118	50 - 150
Perfluoroheptanesulfonic acid (PFHpS)	2.00	2.28	J	ng/L		114	50 - 150
Perfluoropentanesulfonic acid (PFPeS)	2.00	2.25	J	ng/L		112	50 - 150

Isotope Dilution	MRL %Recovery	MRL Qualifier	MRL Limits
13C3 HFPO-DA	82		50 - 200
13C6 PFDA	88		50 - 200
13C5 PFHxA	89		50 - 200
13C4 PFHpA	93		50 - 200
13C8 PFOA	91		50 - 200
13C9 PFNA	91		50 - 200
13C7 PFUnA	82		50 - 200
13C2 PFDoA	90		50 - 200
13C4 PFBA	95		50 - 200
13C5 PFPeA	91		50 - 200
13C3 PFBS	99		50 - 200
13C3 PFHxS	94		50 - 200
13C8 PFOS	92		50 - 200

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MRL 380-50566/22-A
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50566

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>MRL MRL Qualifier</i>	<i>Limits</i>
13C2-4:2-FTS	98		50 - 200
13C2-6:2-FTS	100		50 - 200
13C2-8:2-FTS	97		50 - 200

Lab Sample ID: 380-56249-B-1-A LMS
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 50566

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>LMS Result</i>	<i>LMS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec Limits</i>
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.00	2.02		ng/L		101	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.00	2.03		ng/L		101	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.00	2.35		ng/L		117	50 - 150
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.00	2.35		ng/L		117	50 - 150
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.00	2.67		ng/L		105	50 - 150
Perfluorodecanoic acid (PFDA)	19		2.00	21.1	4	ng/L		95	50 - 150
Perfluorododecanoic acid (PFDoA)	<2.0		2.00	2.13		ng/L		106	50 - 150
Perfluoroheptanoic acid (PFHpA)	140		2.00	143	4	ng/L		-14	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	2.2		2.00	4.43		ng/L		110	50 - 150
Perfluorohexanoic acid (PFHxA)	180	E	2.00	173	4	ng/L		-601	50 - 150
Perfluorononanoic acid (PFNA)	27		2.00	28.7	4	ng/L		94	50 - 150
Perfluorooctanesulfonic acid (PFOS)	140		2.00	139	4	ng/L		-80	50 - 150
Perfluorooctanoic acid (PFOA)	310	E	2.00	315	E 4	ng/L		355	50 - 150
Perfluoroundecanoic acid (PFUnA)	<2.0		2.00	2.74		ng/L		115	50 - 150
Perfluorobutanoic acid (PFBA)	100		2.00	103	4	ng/L		160	50 - 150
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	12		2.00	15.4	4	ng/L		181	50 - 150
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.00	2.46		ng/L		123	50 - 150
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.4		2.00	4.46		ng/L		103	50 - 150
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.00	2.92		ng/L		98	50 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<2.0		2.00	2.16		ng/L		108	50 - 150
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.00	2.18		ng/L		109	50 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.00	2.46		ng/L		123	50 - 150
Perfluoropentanoic acid (PFPeA)	140		2.00	139	4	ng/L		112	50 - 150
Perfluoroheptanesulfonic acid (PFHpS)	3.2		2.00	5.40		ng/L		109	50 - 150
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.00	2.72		ng/L		114	50 - 150

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

<i>Isotope Dilution</i>	<i>LMS</i> <i>%Recovery</i>	<i>LMS</i> <i>Qualifier</i>	<i>Limits</i>
13C3 HFPO-DA	92		50 - 200
13C6 PFDA	101		50 - 200
13C5 PFHxA	98		50 - 200
13C4 PFHpA	97		50 - 200
13C8 PFOA	88		50 - 200
13C9 PFNA	95		50 - 200
13C7 PFUnA	98		50 - 200
13C2 PFDoA	106		50 - 200
13C4 PFBA	90		50 - 200
13C5 PFPeA	90		50 - 200
13C3 PFBS	93		50 - 200
13C3 PFHxS	87		50 - 200
13C8 PFOS	90		50 - 200
13C2-4:2-FTS	90		50 - 200
13C2-6:2-FTS	84		50 - 200
13C2-8:2-FTS	91		50 - 200

Lab Sample ID: 380-56249-C-1-A LMSD
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 50566

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>LMSD</i> <i>Result</i>	<i>LMSD</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec</i> <i>Limits</i>	<i>RPD</i>	<i>RPD</i> <i>Limit</i>
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.00	1.96	J	ng/L		98	50 - 150	3	50
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.00	2.12		ng/L		106	50 - 150	4	50
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.00	2.41		ng/L		120	50 - 150	3	50
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.00	2.37		ng/L		118	50 - 150	1	50
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.00	2.97		ng/L		120	50 - 150	11	50
Perfluorodecanoic acid (PFDA)	19		2.00	21.0	4	ng/L		89	50 - 150	1	50
Perfluorododecanoic acid (PFDoA)	<2.0		2.00	2.17		ng/L		108	50 - 150	2	50
Perfluoroheptanoic acid (PFHpA)	140		2.00	145	4	ng/L		116	50 - 150	2	50
Perfluorohexanesulfonic acid (PFHxS)	2.2		2.00	4.47		ng/L		112	50 - 150	1	50
Perfluorohexanoic acid (PFHxA)	180	E	2.00	175	4	ng/L		-488	50 - 150	1	50
Perfluorononanoic acid (PFNA)	27		2.00	28.3	4	ng/L		75	50 - 150	1	50
Perfluorooctanesulfonic acid (PFOS)	140		2.00	137	4	ng/L		-165	50 - 150	1	50
Perfluorooctanoic acid (PFOA)	310	E	2.00	310	E 4	ng/L		87	50 - 150	2	50
Perfluoroundecanoic acid (PFUnA)	<2.0		2.00	2.57		ng/L		106	50 - 150	7	50
Perfluorobutanoic acid (PFBA)	100		2.00	99.2	4	ng/L		-31	50 - 150	4	50
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	12		2.00	14.2	4	ng/L		121	50 - 150	8	50
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.00	2.66		ng/L		133	50 - 150	8	50
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.4		2.00	4.72		ng/L		116	50 - 150	6	50

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-56249-C-1-A LMSD
Matrix: Water
Analysis Batch: 50935

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 50566

Analyte	Sample Result	Sample Qualifier	Spike Added	LMSD Result	LMSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nonafluoro-3,6-dioxahheptanoic acid (NFDHA)	<2.0		2.00	2.86		ng/L		95	50 - 150	2	50
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.00	2.38		ng/L		119	50 - 150	10	50
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.00	2.15		ng/L		107	50 - 150	2	50
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.00	2.46		ng/L		123	50 - 150	0	50
Perfluoropentanoic acid (PFPeA)	140		2.00	140	4	ng/L		121	50 - 150	0	50
Perfluoroheptanesulfonic acid (PFHpS)	3.2		2.00	5.47		ng/L		112	50 - 150	1	50
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.00	2.55		ng/L		105	50 - 150	6	50

Isotope Dilution	LMSD %Recovery	LMSD Qualifier	Limits
13C3 HFPO-DA	91		50 - 200
13C6 PFDA	96		50 - 200
13C5 PFHxA	96		50 - 200
13C4 PFHpA	91		50 - 200
13C8 PFOA	89		50 - 200
13C9 PFNA	95		50 - 200
13C7 PFUnA	96		50 - 200
13C2 PFDoA	102		50 - 200
13C4 PFBA	93		50 - 200
13C5 PFPeA	93		50 - 200
13C3 PFBS	87		50 - 200
13C3 PFHxS	87		50 - 200
13C8 PFOS	89		50 - 200
13C2-4:2-FTS	87		50 - 200
13C2-6:2-FTS	85		50 - 200
13C2-8:2-FTS	90		50 - 200

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MBL 380-49932/23-A
Matrix: Water
Analysis Batch: 50570

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49932

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<1.0		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorooctanesulfonic acid (PFOS)	<0.43		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluoroundecanoic acid (PFUnA)	<0.42		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.58		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.42		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorohexanoic acid (PFHxA)	<0.46		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorododecanoic acid (PFDoA)	<0.54		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorooctanoic acid (PFOA)	<0.38		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: MBL 380-49932/23-A
Matrix: Water
Analysis Batch: 50570

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49932

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	<0.32		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorobutanesulfonic acid (PFBS)	<0.37		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluoroheptanoic acid (PFHpA)	<0.39		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorononanoic acid (PFNA)	<0.40		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorotetradecanoic acid (PFTA)	<0.54		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
Perfluorotridecanoic acid (PFTrDA)	<0.36		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<0.30		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.30		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		2.0	ng/L		08/02/23 06:55	08/07/23 10:42	1

Surrogate	MBL %Recovery	MBL Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	118		70 - 130	08/02/23 06:55	08/07/23 10:42	1
13C2 PFHxA	129		70 - 130	08/02/23 06:55	08/07/23 10:42	1
13C2 PFDA	128		70 - 130	08/02/23 06:55	08/07/23 10:42	1
13C3-GenX	113		70 - 130	08/02/23 06:55	08/07/23 10:42	1

Lab Sample ID: LCS 380-49932/25-A
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide	25.1	23.8		ng/L		95	70 - 130
Dimer Acid (HFPO-DA/GenX)							
Perfluorooctanesulfonic acid (PFOS)	23.2	24.3		ng/L		105	70 - 130
Perfluoroundecanoic acid (PFUnA)	25.1	24.2		ng/L		97	70 - 130
N-methylperfluorooctanesulfonamide-1,1,1-trifluoro-2,2,2-trifluoroethane-3-sulfonic acid (NMeFOSAA)	25.1	23.7		ng/L		95	70 - 130
N-ethylperfluorooctanesulfonamide-1,1,1-trifluoro-2,2,2-trifluoroethane-3-sulfonic acid (NEtFOSAA)	25.1	23.6		ng/L		94	70 - 130
Perfluorohexanoic acid (PFHxA)	25.1	26.7		ng/L		106	70 - 130
Perfluorododecanoic acid (PFDoA)	25.1	24.2		ng/L		96	70 - 130
Perfluorooctanoic acid (PFOA)	25.1	27.9		ng/L		111	70 - 130
Perfluorodecanoic acid (PFDA)	25.1	25.7		ng/L		103	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	22.9	23.8		ng/L		104	70 - 130
Perfluorobutanesulfonic acid (PFBS)	22.2	24.8		ng/L		112	70 - 130
Perfluoroheptanoic acid (PFHpA)	25.1	26.5		ng/L		106	70 - 130
Perfluorononanoic acid (PFNA)	25.1	27.0		ng/L		108	70 - 130
Perfluorotetradecanoic acid (PFTA)	25.1	26.1		ng/L		104	70 - 130
Perfluorotridecanoic acid (PFTrDA)	25.1	25.7		ng/L		103	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	23.5	23.3		ng/L		99	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 380-49932/25-A
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	23.7	22.7		ng/L		96	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	23.7	25.3		ng/L		107	70 - 130
LCS LCS							
Surrogate	%Recovery	Qualifier	Limits				
d5-NEtFOSAA	108		70 - 130				
13C2 PFHxA	124		70 - 130				
13C2 PFDA	116		70 - 130				
13C3-GenX	116		70 - 130				

Lab Sample ID: LCSD 380-49932/26-A
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	25.1	22.1		ng/L		88	70 - 130	7	30
Perfluorooctanesulfonic acid (PFOS)	23.2	24.4		ng/L		105	70 - 130	0	30
Perfluoroundecanoic acid (PFUnA)	25.1	23.8		ng/L		95	70 - 130	2	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	25.1	26.0		ng/L		104	70 - 130	9	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	25.1	25.0		ng/L		100	70 - 130	6	30
Perfluorohexanoic acid (PFHxA)	25.1	24.4		ng/L		97	70 - 130	9	30
Perfluorododecanoic acid (PFDoA)	25.1	22.3		ng/L		89	70 - 130	8	30
Perfluorooctanoic acid (PFOA)	25.1	28.0		ng/L		112	70 - 130	0	30
Perfluorodecanoic acid (PFDA)	25.1	25.6		ng/L		102	70 - 130	0	30
Perfluorohexanesulfonic acid (PFHxS)	22.9	21.8		ng/L		95	70 - 130	9	30
Perfluorobutanesulfonic acid (PFBS)	22.2	23.7		ng/L		106	70 - 130	5	30
Perfluoroheptanoic acid (PFHpA)	25.1	24.2		ng/L		97	70 - 130	9	30
Perfluorononanoic acid (PFNA)	25.1	27.3		ng/L		109	70 - 130	1	30
Perfluorotetradecanoic acid (PFTA)	25.1	23.9		ng/L		95	70 - 130	9	30
Perfluorotridecanoic acid (PFTrDA)	25.1	25.3		ng/L		101	70 - 130	2	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	23.5	24.0		ng/L		102	70 - 130	3	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	23.7	21.8		ng/L		92	70 - 130	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	23.7	23.4		ng/L		99	70 - 130	8	30

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 380-49932/26-A
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49932

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
d5-NEtFOSAA	113		70 - 130
13C2 PFHxA	114		70 - 130
13C2 PFDA	114		70 - 130
13C3-GenX	107		70 - 130

Lab Sample ID: MRL 380-49932/24-A
Matrix: Water
Analysis Batch: 50570

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Spike Added	MRL	MRL	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	2.01	1.65	J	ng/L		82	50 - 150
Perfluorooctanesulfonic acid (PFOS)	1.86	1.94	J	ng/L		104	50 - 150
Perfluoroundecanoic acid (PFUnA)	2.01	1.84	J	ng/L		92	50 - 150
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.01	2.10	J	ng/L		105	50 - 150
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.01	1.99	J	ng/L		99	50 - 150
Perfluorohexanoic acid (PFHxA)	2.01	1.99	J	ng/L		99	50 - 150
Perfluorododecanoic acid (PFDoA)	2.01	1.91	J	ng/L		95	50 - 150
Perfluorooctanoic acid (PFOA)	2.01	2.23	J	ng/L		111	50 - 150
Perfluorodecanoic acid (PFDA)	2.01	1.93	J	ng/L		96	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	1.83	2.16	J	ng/L		118	50 - 150
Perfluorobutanesulfonic acid (PFBS)	1.78	1.79	J	ng/L		101	50 - 150
Perfluoroheptanoic acid (PFHpA)	2.01	1.92	J	ng/L		95	50 - 150
Perfluorononanoic acid (PFNA)	2.01	2.11	J	ng/L		105	50 - 150
Perfluorotetradecanoic acid (PFTA)	2.01	2.45	J	ng/L		122	50 - 150
Perfluorotridecanoic acid (PFTrDA)	2.01	1.88	J	ng/L		94	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	1.88	1.79	J	ng/L		95	50 - 150
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.90	1.70	J	ng/L		90	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.90	1.77	J	ng/L		93	50 - 150

Surrogate	MRL		Limits
	%Recovery	Qualifier	
d5-NEtFOSAA	113		70 - 130
13C2 PFHxA	106		70 - 130
13C2 PFDA	104		70 - 130
13C3-GenX	92		70 - 130

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 380-56347-B-2-A MS
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier					
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.01	<2.0		ng/L		93		70 - 130
Perfluorooctanesulfonic acid (PFOS)	<2.0		1.86	2.04		ng/L		109		70 - 130
Perfluoroundecanoic acid (PFUnA)	<2.0		2.01	2.12		ng/L		105		70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.01	<2.0		ng/L		95		70 - 130
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.01	<2.0		ng/L		93		70 - 130
Perfluorohexanoic acid (PFHxA)	<2.0		2.01	2.20		ng/L		110		70 - 130
Perfluorododecanoic acid (PFDoA)	<2.0		2.01	2.20		ng/L		110		70 - 130
Perfluorooctanoic acid (PFOA)	<2.0		2.01	2.32		ng/L		115		70 - 130
Perfluorodecanoic acid (PFDA)	<2.0		2.01	2.38		ng/L		118		70 - 130
Perfluorohexanesulfonic acid (PFHxS)	<2.0		1.83	<2.0		ng/L		95		70 - 130
Perfluorobutanesulfonic acid (PFBS)	<2.0		1.78	<2.0		ng/L		99		70 - 130
Perfluoroheptanoic acid (PFHpA)	<2.0		2.01	2.05		ng/L		102		70 - 130
Perfluorononanoic acid (PFNA)	<2.0		2.01	2.42		ng/L		121		70 - 130
Perfluorotetradecanoic acid (PFTA)	<2.0		2.01	2.36		ng/L		118		70 - 130
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.01	2.36		ng/L		118		70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<2.0		1.88	2.09		ng/L		111		70 - 130
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		1.90	2.01		ng/L		106		70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		1.90	<2.0		ng/L		103		70 - 130

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
d5-NEtFOSAA	110		70 - 130
13C2 PFHxA	120		70 - 130
13C2 PFDA	123		70 - 130
13C3-GenX	102		70 - 130

Lab Sample ID: 380-56347-C-2-A MSD
Matrix: Water
Analysis Batch: 50496

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 49932

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	
	Result	Qualifier	Added	Result	Qualifier						RPD	Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.01	2.07		ng/L		103		70 - 130	11	30
Perfluorooctanesulfonic acid (PFOS)	<2.0		1.86	2.10		ng/L		113		70 - 130	3	30
Perfluoroundecanoic acid (PFUnA)	<2.0		2.01	2.09		ng/L		104		70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.01	<2.0		ng/L		98		70 - 130	3	30

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 380-56347-C-2-A MSD

Matrix: Water

Analysis Batch: 50496

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 49932

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		
N-ethylperfluorooctanesulfonamide acetic acid (NEtFOSAA)	<2.0		2.01	<2.0		ng/L		99	70 - 130	6	30
Perfluorohexanoic acid (PFHxA)	<2.0		2.01	2.33		ng/L		116	70 - 130	6	30
Perfluorododecanoic acid (PFDoA)	<2.0		2.01	2.09		ng/L		104	70 - 130	5	30
Perfluorooctanoic acid (PFOA)	<2.0		2.01	2.32		ng/L		115	70 - 130	0	30
Perfluorodecanoic acid (PFDA)	<2.0		2.01	2.15		ng/L		107	70 - 130	10	30
Perfluorohexanesulfonic acid (PFHxS)	<2.0		1.83	<2.0		ng/L		107	70 - 130	12	30
Perfluorobutanesulfonic acid (PFBS)	<2.0		1.78	2.15		ng/L		121	70 - 130	20	30
Perfluoroheptanoic acid (PFHpA)	<2.0		2.01	2.27		ng/L		113	70 - 130	10	30
Perfluorononanoic acid (PFNA)	<2.0		2.01	2.25		ng/L		112	70 - 130	8	30
Perfluorotetradecanoic acid (PFTA)	<2.0		2.01	<2.0		ng/L		97	70 - 130	19	30
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.01	2.26		ng/L		113	70 - 130	4	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<2.0		1.88	<2.0		ng/L		100	70 - 130	11	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		1.90	<2.0		ng/L		102	70 - 130	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		1.90	2.06		ng/L		108	70 - 130	5	30
Surrogate		MSD	MSD								
		%Recovery	Qualifier	Limits							
d5-NEtFOSAA		122		70 - 130							
13C2 PFHxA		128		70 - 130							
13C2 PFDA		126		70 - 130							
13C3-GenX		117		70 - 130							

QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

LCMS

Prep Batch: 49932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-56354-1	AIEA GULCH WELLS PUMP 2	Total/NA	Water	537.1 DW	
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	537.1 DW	
380-56354-3	FB: AIEA GULCH WELLS PUMP 2	Total/NA	Water	537.1 DW	
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	537.1 DW	
MBL 380-49932/23-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 380-49932/25-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 380-49932/26-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	
MRL 380-49932/24-A	Lab Control Sample	Total/NA	Water	537.1 DW	
380-56347-B-2-A MS	Matrix Spike	Total/NA	Water	537.1 DW	
380-56347-C-2-A MSD	Matrix Spike Duplicate	Total/NA	Water	537.1 DW	

Analysis Batch: 50496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-56354-1	AIEA GULCH WELLS PUMP 2	Total/NA	Water	537.1	49932
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	537.1	49932
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	537.1	49932
LCS 380-49932/25-A	Lab Control Sample	Total/NA	Water	537.1	49932
LCSD 380-49932/26-A	Lab Control Sample Dup	Total/NA	Water	537.1	49932
380-56347-B-2-A MS	Matrix Spike	Total/NA	Water	537.1	49932
380-56347-C-2-A MSD	Matrix Spike Duplicate	Total/NA	Water	537.1	49932

Prep Batch: 50566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-56354-1	AIEA GULCH WELLS PUMP 2	Total/NA	Water	533	
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	533	
380-56354-3	FB: AIEA GULCH WELLS PUMP 2	Total/NA	Water	533	
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	533	
MBL 380-50566/21-A	Method Blank	Total/NA	Water	533	
LCS 380-50566/23-A	Lab Control Sample	Total/NA	Water	533	
LCSD 380-50566/24-A	Lab Control Sample Dup	Total/NA	Water	533	
MRL 380-50566/22-A	Lab Control Sample	Total/NA	Water	533	
380-56249-B-1-A LMS	Matrix Spike	Total/NA	Water	533	
380-56249-C-1-A LMSD	Matrix Spike Duplicate	Total/NA	Water	533	

Analysis Batch: 50570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MBL 380-49932/23-A	Method Blank	Total/NA	Water	537.1	49932
MRL 380-49932/24-A	Lab Control Sample	Total/NA	Water	537.1	49932

Analysis Batch: 50935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-56354-1	AIEA GULCH WELLS PUMP 2	Total/NA	Water	533	50566
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	533	50566
380-56354-3	FB: AIEA GULCH WELLS PUMP 2	Total/NA	Water	533	50566
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	Total/NA	Water	533	50566
MBL 380-50566/21-A	Method Blank	Total/NA	Water	533	50566
LCS 380-50566/23-A	Lab Control Sample	Total/NA	Water	533	50566
LCSD 380-50566/24-A	Lab Control Sample Dup	Total/NA	Water	533	50566
MRL 380-50566/22-A	Lab Control Sample	Total/NA	Water	533	50566
380-56249-B-1-A LMS	Matrix Spike	Total/NA	Water	533	50566
380-56249-C-1-A LMSD	Matrix Spike Duplicate	Total/NA	Water	533	50566

Eurofins Eaton Analytical Pomona

QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

LCMS

Analysis Batch: 51046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-56354-3	FB: AIEA GULCH WELLS PUMP 2	Total/NA	Water	537.1	49932

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Lab Chronicle

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Client Sample ID: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-1

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	533			50566	XTD8	EA POM	08/07/23 04:32
Total/NA	Analysis	533		1	50935	UKDT	EA POM	08/10/23 02:21
Total/NA	Prep	537.1 DW			49932	US1B	EA POM	08/02/23 06:55
Total/NA	Analysis	537.1		1	50496	UKDT	EA POM	08/05/23 19:13

Client Sample ID: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-2

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	533			50566	XTD8	EA POM	08/07/23 04:32
Total/NA	Analysis	533		1	50935	UKDT	EA POM	08/10/23 02:31
Total/NA	Prep	537.1 DW			49932	US1B	EA POM	08/02/23 06:55
Total/NA	Analysis	537.1		1	50496	UKDT	EA POM	08/05/23 19:33

Client Sample ID: FB: AIEA GULCH WELLS PUMP 2

Lab Sample ID: 380-56354-3

Date Collected: 07/24/23 10:00

Matrix: Water

Date Received: 07/26/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	533			50566	XTD8	EA POM	08/07/23 04:32
Total/NA	Analysis	533		1	50935	UKDT	EA POM	08/10/23 02:40
Total/NA	Prep	537.1 DW			49932	US1B	EA POM	08/02/23 06:55
Total/NA	Analysis	537.1		1	51046	Y7BM	EA POM	08/10/23 07:53

Client Sample ID: FB: AIEA WELLS PUMPS 1&2 (260)

Lab Sample ID: 380-56354-4

Date Collected: 07/24/23 10:30

Matrix: Water

Date Received: 07/26/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	533			50566	XTD8	EA POM	08/07/23 04:32
Total/NA	Analysis	533		1	50935	UKDT	EA POM	08/10/23 02:50
Total/NA	Prep	537.1 DW			49932	US1B	EA POM	08/02/23 06:55
Total/NA	Analysis	537.1		1	50496	UKDT	EA POM	08/05/23 19:54

Laboratory References:

EA POM = Eurofins Eaton Analytical Pomona, 941 Corporate Center Drive, Pomona, CA 91768-2642, TEL (626)386-1100

Accreditation/Certification Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-56354-1

Laboratory: Eurofins Eaton Analytical Pomona

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Hawaii	State	CA00006	01-31-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
533	533	Water	11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
533	533	Water	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)
533	533	Water	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)
533	533	Water	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)
533	533	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
533	533	Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)
533	533	Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
533	533	Water	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
533	533	Water	Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)
533	533	Water	Perfluoro-3-methoxypropanoic acid (PFMPA)
533	533	Water	Perfluoro-4-methoxybutanoic acid (PFMBA)
533	533	Water	Perfluorobutanoic acid (PFBA)
533	533	Water	Perfluoroheptanesulfonic acid (PFHpS)
533	533	Water	Perfluoropentanesulfonic acid (PFPeS)
533	533	Water	Perfluoropentanoic acid (PFPeA)
537.1	537.1 DW	Water	11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
537.1	537.1 DW	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1	537.1 DW	Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)
537.1	537.1 DW	Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)

Method Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Method	Method Description	Protocol	Laboratory
533	Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water	EPA	EA POM
537.1	Perfluorinated Alkyl Acids (LC/MS)	EPA	EA POM
533	Extraction of Perfluorinated and Polyfluorinated Alkyl Acids	EPA	EA POM
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	EA POM

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EA POM = Eurofins Eaton Analytical Pomona, 941 Corporate Center Drive, Pomona, CA 91768-2642, TEL (626)386-1100



Sample Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-56354-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
380-56354-1	AIEA GULCH WELLS PUMP 2	Water	07/24/23 10:00	07/26/23 10:10
380-56354-2	AIEA WELLS PUMPS 1&2 (260)	Water	07/24/23 10:30	07/26/23 10:10
380-56354-3	FB: AIEA GULCH WELLS PUMP 2	Water	07/24/23 10:00	07/26/23 10:10
380-56354-4	FB: AIEA WELLS PUMPS 1&2 (260)	Water	07/24/23 10:30	07/26/23 10:10

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Client Information		Lab PM		Carrier Tracking No(s)		COC No								
Client Contact: Dr Ron Fenstermacher		Arada, Rachelle		380-27941-2757 2		380-27941-2757 2								
Company City & County of Honolulu		E-Mail Rachelle Arada@et.euronisus.com		State of Origin		Page Page 2 of 2								
Address 630 South Beretania Street, Chemistry Lab		PWSID		Job #		Job #								
City Honolulu		Due Date Requested:		Analysis Requested		Preservation Codes:								
State, Zip HI, 96843		TAT Requested (days):		533 - All Analytes		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecylhydrate								
Phone 808-748-5091 (tel)		Compliance Project: <input type="checkbox"/> No		57.1 DW_PREC - 8015 Gas (Purgeable) LL (EAL)		U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify)								
Email rfenstermacher@hbws.org		PO # C20525101 exp 05312023		525.2_PREC - (MOD) 525plus PLUS TICs		Other:								
Project Name RED-HILL/HBWS sites Event Desc. RUSH Weekly Red Hill		WO #		SUBCONTRACT - 8015 Diesel LL (EAL) and Motor Oil										
Site Site		Project # 3800111		SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)										
		SSOW#		SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs										
				SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)										
				SUBCONTRACT - 8015 Diesel LL (EAL) and Motor Oil										
				Form MS/MSD (Yes or No)										
				Field Filtered Sample (Yes or No)										
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=volatile, BT=tissue, AA=air)	R	R	R	RA	RA	Y	N	Total Number of containers	Special Instructions/Note:	
MOANALUA WELLS				Water									(752A) 7/2/25	
AIEA GULCH WELLS PUMP2	7/24/23	1000	G	Water								33	Fed X 772843429746	
AIEA WELLS PUMPS 1&2 (260)	7/24/23	1030	G	Water								33	Pump 2	
HALAWA WELLS UNITS 1&2				Water									(752A) 25/23	
FB MOANALUA WELLS				Water									Fed X 772843430125	
FB AIEA GULCH WELLS PUMP2	7/24/23	1000		Water										
FB AIEA WELLS PUMPS 1&2 (260)	7/24/23	1030		Water										
FB HALAWA WELLS UNITS 1&2				Water										
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)													Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Empty Kit Relinquished by													Method of Shipment: Fed X 772843430125	
Relinquished by [redacted]													Date/Time 7/26/23 1010	
Relinquished by													Date/Time 7/26/23 1010	
Relinquished by													Date/Time	
Custody Seals Intact <input type="checkbox"/> Yes <input type="checkbox"/> No													Cooler Temperature(s) °C and Other Remarks: (752A) 3.1/2.7 gel - frozen	

Login Sample Receipt Checklist

Client: City & County of Honolulu

Job Number: 380-56354-1

Login Number: 56354
List Number: 1
Creator: Elyas, Matthew

List Source: Eurofins Eaton Analytical Pomona

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Samples do not require splitting or compositing.	True	
Container provided by EEA	True	